Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application. As indicated in a Response to Office Action mailed by the Applicant on May 25, 2004, claims 32, 76 and 77 have been amended. Dependent claim 89 has been renumbered herein for compliance purposes.

Listing of Claims:

1. (original) An assay device, comprising:

a LED source configured to generate a light;

a radial waveguide configured to receive a portion of said light generated by said LED source and radially distribute said portion of said light;

a plurality of vessel wells each configured to receive an analyte vessel and disposed radially to said radial waveguide; and

a plurality of light transducers each configured to transduce a transmitted portion of said light radially distributed by said radial waveguide that has passed through said vessel well.

2. (original) The assay device according to claim 1, further comprising:

a second LED source configured to generate a second light;

a second radial waveguide configured to receive a portion of said second light generated by said second LED source and radially distribute said portion of said second light to said plurality of vessel wells; and

a second plurality of light transducers each configured to transduce a portion of said second light radially distributed by said second radial waveguide that has passed through said vessel well.

3. (original) The assay device according to claim 2, wherein said second radial waveguide comprises a plurality of wedge waveguides.

4. (original) The assay device according to claim 1, wherein said radial waveguide comprises a plurality of wedge waveguides.

5. (original) The assay device according to claim 4, wherein each of said plurality of wedge waveguides comprises a curved wedge waveguide.

6. (original) The assay device according to claim 4, wherein each of said plurality of wedge waveguides comprises a lensmatic wedge waveguide.

7. (original) The assay device according to claim 1, further comprising a second plurality of light transducers each configured to transduce a portion of said light radially distributed by said radial waveguide that has passed through said vessel well.

8. (original) The assay device according to claim 7, wherein said second plurality of light transducers transduces light that has passed through a side portion of said vessel well.

9. (original) The assay device according to claim 7, wherein said second plurality of light transducers transduces light that has passed through a bottom portion of said vessel well.

10. (original) The assay device according to claim 7, wherein said second plurality of light transducers is used to detect a presence of said analyte vessel in said vessel well.

11. (original) The assay device according to claim 1, further comprising a modulator configured to modulate an intensity of said light generated by said LED source.

12. (original) The assay device according to claim 11, wherein said modulator is configured to turn on and off said LED source.

13. (original) The assay device according to claim 1, wherein said LED source generates light having a wavelength of 470 nm +/- 30 nm.

14. (original) The assay device according to claim 1, further comprising an optical filter.

15. (original) The assay device according to claim 14, wherein said optical filter is disposed along an optical path between said LED source and said radial waveguide

16. (original) The assay device according to claim 1, wherein said plurality of vessel wells is disposed in a substantially circular geometry around said LED source.

17. (original) The assay device according to claim 1, wherein said plurality of vessel wells comprises two concentric circular rows of said vessel wells around said LED source, wherein vessel wells of said two concentric circular rows are staggered to receive said light radially distributed by said radial waveguide.

18. (original) The assay device according to claim 1, further comprising a plurality of light pipes configured to reflect and conduct said transmitted portion of said light that has passed through said vessel well to said plurality of light transducers.

19. (original) The assay device according to claim 18, wherein said plurality of light pipes is configured to reflect and conduct said transmitted portion of said light that has passed through said vessel well downward.

20. (original) The assay device according to claim 19, wherein said plurality of light transducers are disposed in a single plane.

21. (original) The assay device according to claim 18, further comprising a printed circuit board supporting said plurality of light transducers.

22. (original) The assay device according to claim 1, further comprising a plurality of printed circuit boards supporting said plurality of light transducers.

23. (original) The assay device according to claim 1, further comprising a vessel support configured to contain said plurality of vessel wells.

24. (original) The assay device according to claim 23, wherein said vessel support comprises:

a heat conducting portion configured to transmit heat to said analyte vessel in said vessel wells; and

a heater configured to maintain said heat conducting portion substantially at an incubation temperature.

25. (original) The assay device according to claim 23, wherein said vessel support further comprises:

a heat insulating portion configured to thermally insulate said heat conducting portion.

26. (original) The assay device according to claim 24, wherein said heater comprises a DC heater.

27. (original) The assay device according to claim 24, wherein:

said heater comprises a ring heater; and

said heat conducting portion comprises a heat conducting ring.

28. (original) The assay device according to claim 27, wherein said ring heater is disposed around said heat conducting ring.

29. (original) The assay device according to claim 1, further comprising a precalibrated temperature transducer.

30. (original) The assay device according to claim 24, further comprising a precalibrated temperature transducer disposed within said heat conducting portion

31. (original) An assay device, comprising:

a light source configured to generate a light;

a plurality of vessel wells each configured to receive an analyte vessel and disposed in an optical path of a portion of said light generated by said light source;

a plurality of optical pipes each configured to receive said portion of said light transmitted along a respective of said optical paths through a respective of said plurality of vessel wells and reflect and conduct said received light; and

a single printed circuit board including a plurality of light transducers each configured to transduce a portion of said light reflected and conducted by a respective of said plurality of optical pipes.

32. (currently amended) An assay device, comprising:

a light source configured to generate a light;

a plurality of vessel wells each configured to receive an analyte vessel and disposed in an optical path of a portion of said light generated by said light source;

a plurality of optical pipes each configured to receive said portion of said light transmitted along a respective of said optical paths through a respective of said plurality of vessel wells and reflect and conduct said received light downward, a first of said plurality of optical pipes configured to receive light through a first portion of a vessel disposed in one of said plurality of vessel wells and a second of said plurality of optical pipes configured to receive light through a second portion of the vessel disposed in the one of said plurality of vessel wells; and

a printed circuit board disposed below said plurality of vessel wells and including a light transducer configured to transduce a portion of said light reflected and conducted by a respective of said plurality of optical pipes.

33-35. (canceled)

36. (original) A method for performing assays comprising:

generating light using a LED;

radially guiding a portion of the generated light;

transmitting a portion of the guided light through a plurality of vessels; and

transducing a portion of the transmitted light to perform an assay.

37. (original) The method according to claim 36, wherein said transmitting step further comprises transmitting a second portion of said guided light through one of a side and a bottom portion of said plurality of vessels to detect the presence of said plurality of vessels.

38. (original) The method according to claim 36, further comprising reflecting said transmitted light from a plurality of vessels in a same direction.

39. (original) The method according to claim 36, further comprising diverging said portion of said generated light.

40. (original) The method according to claim 39, wherein said diverging step and said radially guiding step are performed by a same light guide.

41. (original) The method according to claim 36, further comprising modulating an intensity of said portion of the transmitted light.

42. (original) The method according to claim 41, wherein said modulating step comprises modulating a generated light intensity.

43. (original) The method according to claim 41, wherein said modulating step comprises alternatively starting and stopping said generating of light.

44. (original) The method according to claim 41, further comprising correcting for a background light intensity.

45. (original) A device for performing assays, comprising:

means for generating light;

means for radially guiding a portion of the generated light;

means for transmitting a portion of the guided light through a plurality of vessels; and

means for transducing a portion of the transmitted light to perform an assay.

46. (original) An assay device, comprising:

a LED source configured to generate a light;

radial waveguide means for receiving a portion of said light generated by said LED source and radially distribute said portion of said light;

a plurality of vessel wells each configured to receive an analyte vessel and disposed radially to said radial waveguide means; and

a plurality of light transducer means for transducing a transmitted portion of said light radially distributed by said radial waveguide means that has passed through said vessel well.

47. (original) The assay device according to claim 46, further comprising:

a second LED source configured to generate a second light;

second radial waveguide means for receiving a portion of said second light generated by said second LED source and radially distribute said portion of said second light to said plurality of vessel wells; and

a second plurality of light transducer means for transducing a portion of said second light radially distributed by said second radial waveguide means that has passed through said vessel well.

48. (original) The assay device according to claim 47, wherein said second radial waveguide means comprises a plurality of wedge waveguide means.

49. (original) The assay device according to claim 47, wherein said radial waveguide means comprises a plurality of wedge waveguide means.

50. (original) The assay device according to claim 49, wherein each of said plurality of wedge waveguide means comprise a curved wedge waveguide.

51. (original) The assay device according to claim 49, wherein each of said plurality of wedge waveguide means comprises a lensmatic wedge waveguide means.

52. (original) The assay device according to claim 46, further comprising a second plurality of light transducer means for transducing a portion of said light radially distributed by said radial waveguide means that has passed through said vessel well.

53. (original) The assay device according to claim 52, wherein said second plurality of light transducer means transduces light that has passed through a side portion of said vessel well.

54. (original) The assay device according to claim 52, wherein said second plurality of light transducer means transduces light that has passed through a bottom portion of said vessel well.

55. (original) The assay device according to claim 52, wherein said second plurality of light transducer means comprises transducer means for detecting a presence of said analyte vessel in said vessel well.

56. (original) The assay device according to claim 46, further comprising a means for modulating an intensity of said light generated by said LED source.

57. (original) The assay device according to claim 56, wherein said means for modulating comprised a means for turning on and off said LED source.

58. (original) The assay device according to claim 46, wherein said LED source generates light having a wavelength of 470 nm +/- 30 nm.

59. (original) The assay device according to claim 46, further comprising a means for filtering a light.

60. (original) The assay device according to claim 59, wherein said means for filtering is disposed along an optical path between said LED source and said radial waveguide means.

61. (original) The assay device according to claim 46, wherein said plurality of vessel wells are disposed in a substantially circular geometry around said LED source.

62. (original) The assay device according to claim 46, wherein said plurality of vessel wells comprises two concentric circular rows of said vessel wells around said LED source, wherein vessel wells of said two concentric circular rows are staggered to receive said light radially distributed by said radial waveguide.

63. (original) The assay device according to claim 46, further comprising a plurality of means for reflecting and conducting said transmitted portion of said light that has passed through said vessel well to said plurality of light transducer means.

64. (original) The assay device according to claim 63, wherein said means for reflecting and conducting are configured to reflect said transmitted portion of said light that has passed through said vessel well downward.

65. (original) The assay device according to claim 64, wherein said plurality of light transducer means are disposed in a single plane.

66. (original) The assay device according to claim 63, further comprising a means for supporting said plurality of light transducers.

67. (original) The assay device according to claim 46, further comprising a plurality of means for supporting said plurality of light transducers.

68. (original) The assay device according to claim 46, further comprising a means for supporting said plurality of vessel wells.

69. (original) The assay device according to claim 68, wherein said means for supporting comprises:

means for conducting heat to said analyte vessel in said vessel wells; and

means for maintaining said means for conducting substantially at an incubation temperature.

70. (original) The assay device according to claim 68, wherein said vessel support further comprises:

means for thermally insulating said means for conducting.

71. (original) The assay device according to claim 69, wherein said means for maintaining comprises a DC means for maintaining.

72. (original) The assay device according to claim 69, wherein:

said means for maintaining comprises an annular means for maintaining; and

said means for conducting comprises an annular means for conducting.

73. (original) The assay device according to claim 72, wherein said annular means for maintaining is disposed around said annular means for conducting.

74. (original) The assay device according to claim 46, further comprising a precalibrated means for transducing temperature.

75. (original) The assay device according to claim 69, further comprising a precalibrated means for transducing temperature disposed within said means for conducting.

76. (currently amended) An assay device, comprising:

means for generating a light;

plural means for receiving an analyte vessel, each disposed along an optical path of a portion of said light generated by said light generating means;

a plurality of means for redirecting light, each configured to receive said portion of said light transmitted along a respective of said optical paths through a respective one of said plurality of means for receiving, a first of said plurality of means for redirecting light configured to receive light through a first portion of a vessel disposed in one of said plural means for receiving an analyte vessel and a second of said plurality of means for redirecting light configured to receive light through a second portion of the vessel disposed in the one of said plural means for receiving an analyte vessel; and

a single means for supporting a plurality of means for transducing a portion of said light reflected by said plurality of means for redirecting light.

77. (currently amended) An assay device, comprising:

means for generating a light;

plural means for receiving an analyte vessel, each disposed along an optical path of a portion of said light generated by said light generating means;

a plurality of means for redirecting light downward, each configured to receive said portion of said light transmitted along a respective of said optical paths through a respective of said plurality of means for receiving, a first of said plural means for redirecting light configured to receive light through a first portion of a vessel disposed in one of said plural means for receiving an analyte vessel and a second of said plural means for redirecting light configured to receive light through a second portion of the vessel disposed in the one of said plural means for receiving an analyte vessel; and

a means for transducing a portion of said light reflected downward by said plurality of means for redirecting light.

78-80. (canceled)

81. (original) The assay device according to claim 1, wherein said LED source generates light having a wavelength of 430 nm +/- 30 nm.

82. (original) The assay device according to claim 1, wherein said LED source generates light having a wavelength less than 720 nm.

83. (original) The assay device according to claim 11, wherein said modulator comprises a control processor.

84. (new) The assay device according to claim 31, further comprising a radial waveguide optically coupled intermediate the light source and at least one of the plurality of vessel wells.

85. (new) The assay device according to claim 32, further comprising a radial waveguide optically coupled intermediate the light source and at least one of the plurality of vessel wells.

86. (new) The assay device according to claim 76, further comprising a radial waveguide optically coupled intermediate the means for generating light and at least one of the plural means for receiving an analyte of vessel.

87. (new) The assay device according to claim 77, further comprising a radial waveguide optically coupled intermediate the means for generating light and at least one of the plural means for receiving an analyte of vessel.

88. (new) The assay device according to claim 31, wherein a first of said plurality of optical pipes is configured to receive light through a first portion of a vessel disposed in one of said plurality of vessel wells and a second of said plurality of optical pipes is configured to receive light through a second portion of the vessel disposed in the one of said plurality of vessel wells.

89. (new) An assay device, comprising:

a light source configured to generate a light;

a plurality of vessel wells each configured to receive an analyte vessel and disposed in an optical path of a portion of said light generated by said light source;

a plurality of optical pipes each configured to receive said portion of said light transmitted along a respective of said optical paths through a respective of said plurality of vessel wells and reflect and conduct said received light downward; and

a printed circuit board disposed below said plurality of vessel wells and including a plurality of light transducers configured to transduce a portion of said light reflected and conducted by a respective of said plurality of optical pipes.

90. (new) The assay device of claim 89, wherein the plurality of optical pipes comprises a first optical pipe configured to receive light through a first portion of a vessel disposed in one of said plurality of vessel wells and a second optical pipe configured to receive light through a second portion of the vessel disposed in the one of said plurality of vessel wells.